self-generating of his "facts of liberty," scattered through French history, and is naturally apt to mistake for a connected relation among them in practical reality, the connected classification of them in his book. The ardor of his political sentiments is purified by their sincerity, and warms his eloquence without vitiating his probity.

A new volume of Michelet's *Histoire de France* is published this day. The general title is *Louis XIV. et la Revocation de l'Edit de Nantes.* The sixteenth and last volume of the fourth and "definitive" edition of Henri Martin's *Histoire de France* is now out of press. To say that it completes the unquestionably best general history of France from the beginning down to the meeting of the National Assembly, is only to reiterate the verdict of sincere, enlightened critics of all parties. What is new and truly important is that it is accompanied by a uniform volume, entirely filled with an admirably complete index—a very model of excellence in its useful kind. M. Louis de Viel-Castel has just put forth the first two of his purposed eight octavos, entitled *l'Histoire de la Restauration:* not a specially remarkable production. Shrewd, tough, old Ulysses, Dupin has given to the world the third volume of his *Memoires*, telling us what he chooses to remember of general political affairs and of his own parliamentary experiences, from 1832 to 1839. The *Campagne d'Italie* by Bazancourt, the official chronicler of the Crimean war, presents the history of the Italian campagn, of course from the French official point of view, with commendable fairness and fulness. The second and concluding volume contains a detailed account of the interview between Prince Napoleon and the Emperor of Austria, at Verona, where the most of the stipulations of Villafranca were explained, defined and settled. It is very curious, interesting, and, if true, as it probably is, proves that many of the assertions made by an Austrian narrator of the circumstances of the Villafranca Treaty were simply false. What makes the difference between the two accounts worthy of attention is, that the Austrian teller of the story, Debrauz, must have spoken by authority, if not of Francis Joseph himself, at least by authority of F. J.'s next friends. *Correspondance de Buffon*, part of which is here published for the first time, with notes by Nadault, Buffon's great grand-nephew, (2 vols., 8vo.): *Vie du R. P. Xavier de Ravignan*, a life of the distinguished father Ravignan, by Father de Poulevoy, a brother Jesuit (2 vols., 8vo.); *Les Livres des Miracles et autres opuscules de George Florent Gregoire*, the second volume of a carefully-reviewed edition of the curious books of miracles, etc., of Gregory of Tours, translated into French; *Des Doctrines Religieuses des Juifs*, religious doctrines of the Jews in the two centuries preceding the Christian era, by Michel Nicolas (1 vol., 8vo.); *Histoire Physique, Economique, et Politique de Paraguay, etc.*, physical, economical, and political history of Paraguay, and of the Jesuit establishments there, by Alfred Demersay, formerly charged with a scientific mission in South America (the first of two large volumes is published—the work will be completed by an atlas); *Les Chansons Populaires de la France*, a large volume of popular songs, collected from all parts of France, with literary notices and musical accompaniments by competent hands, and profuse illustrative engravings, from designs by various artists; a curious book, that would be withal a fine centertable ornamental book, if it were not for the *esprit gaulois* of too many of the songs—*esprit gaulois* is a euphuistic French synonym for excessive grossness. Such is a part of the list of the books notable for their worth in different kinds, issued from the Parisian press since last February. There are yet several others deserving notice. Chiefest among them is *La Verite sur la Russie*, by Prince Peter Dolgorouki. It is making a veritable sensation among the Russians here. If its revelations on the state of Russia be but half true, Czar Alexander need to hasten reforms, if he would not be overtaken by the revolution which the obstinate impolicy of his father, Czar Nicholas—that excessively overrated godaster—has prepared.

ART AT WASHINGTON.

MORE MURAL DECORATION—PAINTINGS.

[Article Three.]

The room of the Committee on Agriculture was, we believe, the first decorated in the style on which we have been commenting, and on its approval or disapproval depended whether work of this sort should be continued. Unfortunately no objection was made to it; probably it occurred to nobody that mural decoration after this manner would be so lavishly used where a strict adherence to the rules of good taste and appropriateness of design was so imperatively demanded. It is remarkable that no one having authority or influence should have suggested, when the apartment was presented as a finished specimen of what so many others were to be, that painted pine doors, and pine window-frames, and pine shutters were a cheap and improper substitute in such a building as the Capitol for heavier wood in its own color; that walls of plaster in such a place should be protected with wainscot of sufficient hight; and that projecting angles of plaster, as in pilasters, should never be without a bead, of wood, metal, or stone, as they are all, we believe, in every part of the edifice, without exception. However, nobody did, we suppose, object or suggest any of these things; and this room especially has been proudly shown as a model of beauty in execution and fitness of design, and many honestly believe it to be so. Now were it, in the first place, finished in wood or marble in the points to which we have just alluded, it might not be improper, considering its use, and that Agriculture is not one of the departments of Government requiring the constant consideration of a Committee in perpetual session, to admit here something more than ordinary decoration. But if done at all, it should be done well, in the exercise of an acute judgment and severe taste. Instead, we have at each end two paintings in fresco, one of Cincinnatus refusing to leave his plow at the call of his country, and the other of Gen. Putnam, who consented. It is not easy to understand the idea of the artist, if he had any. Are peace and agriculture better than war, and therefore Cincinnatus right and Putnam wrong, and the old days better than the new? Or is war better than peace and agriculture, and Putnam right and the Roman wrong? It seems to have been considered enough if each picture had a plow in it, no more significant illustration of agriculture occurring to the designer than these two well-known historical incidents, which only show that there have been two soldiers who were also farmers. The frescoes of the ceiling betray the same meagerness of invention. They represent the four seasons, and are no better than may be found in any well-illustrated Almanac. Two small pictures of a harvest-field are less objectionable, but chiefly because they are less obtrusive; but the medallion portraits of Washington and Jefferson, painted in imitation of basso-relievo, are made unmeaning, undignified, and absurd by a crowd of Houris, or Hebes, or Cupids, or Cherubs, or whatever they are meant to be, with which the portraits are surrounded. The intervening spaces are filled with Cupids and flowers—a resource that never fails the designer. And on the whole, this room, which might have been an attractive and beautiful feature of the Capitol, is without originality in conception, or merit in execution.

A similar room was made for a Committee on Horticulture. The room itself is well enough—as rooms go in the Capitol—and is as bright and as many-colored as a nosegay; but unhappily Congress has no Committee on Horticulture for its occupation. It has been turned over accordingly to the Committee on the District, and the gentlemen who have in charge the affairs of the ten miles square sit enshrined in this gay bower, Cherubs and Cupids crowning their reverend heads with garlands, and tantalizing them with the similucra of all manner of luscious fruits for ever and ever; or—to change the figure—they buzz like bees among these bright daisies and daffodillies while thrusting their long bills into the national store of honey.

Another apartment, one not often in use, and admitting, therefore, of more than ordinary decoration as a place of exhibition, is called "The President's Room." A sight to see it certainly is, for it is as brilliant, as dazzling, and as curious as a gigantic kaleidoscope. Here as everywhere else propriety and good taste are outraged by the use of painted pine in the wood-work, by the absence of wainscoting, and by the lavish expenditure of color in the most florid style upon every inch of plaster, partly in distemper and partly in oil. The designer very properly reflected that the introduction of historical paintings would be appropriate in a room devoted to the use of the Chief Magistrate, and he chose accordingly, by what rule of choice we know not, to fix upon the walls the portraits of Columbus, Americus Vespucius, Brewster, Franklin, Washington, and some of the members of his Cabinet, Knox, Hamilton, Jefferson, Randolph, and Osgood. Beside these, in the ceiling are allegorical representations of Liberty, the Executive, Legislation, and Religion; and Cherubs, as usual, are flying about in every direction. As some of these portraits are certainly not those which are acknowledged to be the best of the persons they represent, and as the meaning of the allegorical design is by no means always apparent, here, as everywhere else, painted beneath the subject, is an explanatory inscription. Though the effect is ludicrous, the purpose is praiseworthy, for the unlearned spectator—or the spectator whether learned or unlearned—would be at a loss to conjecture why the rosy young woman of the flowing robes who represents Law should not be the Executive, or why she who is called the Executive should not be Religion. If the ghosts of the venerable men whose portraits cover the walls ever visit this scene of their gay and brilliant apotheosis, they will marvel at these inscriptions intended to teach the rising generations that the grave purposes to which their lives were devoted in the establishment of Liberty, Religion, and Law, could be most properly typified by these plump and blushing, not to say voluptuous, young maidens, reclining upon damp clouds, surrounded, some of them, by large families of babies. We trust, however, we are not hypercritical in suggesting with due soberness that a somewhat different style of decoration would have been more appropriate in a room to be only occasionally occupied by the Chief Magistrate of the State, and that whatever portraits of the early discoverers of the country, or founders of our institutions, should be chosen to lend dignity to the place, they should all have had, as works of art, something more of merit than belongs to an ordinary colored photograph. This gilded saloon, brilliant with fanciful designs, its gorgeous walls reflected on every side from mirrors reaching from floor to ceiling, needs only that its actual portraits and its descriptive inscriptions should be painted out, to render it quite as fit for the bridal state-room of a steamer, or the private supper-room of some magnificent establishment devoted to the pleasures of the senses, as for the dignified use to which it is to be devoted. Its inappropriateness is rendered more striking if one passes from it to the withdrawing room of the Senate. We enter here by massive doors of solid mahogany, and are glad to find refuge and repose in a marble hall from the universal surroundings, everywhere else, of plaster and of paint. The walls are of marble; the ceiling is of marble, supported by a double row of fluted marble columns with capitals of the finest execution. A niche here and there admits of decoration by art in accordance with its general character, and will add, if works of merit shall ever fill them, to the stately beauty of this noble apartment. We do not mean to say that the President's Room should have been precisely like this, as the extent of the Capitol and the variety of purpose to which its different parts are devoted admit of great variety of treatment. But the simple dignity and chaste and severe beauty of the one is in very striking contrast with the gaudy, inappropriate, and meretricious character of the other, and of the unhappy attempts at art which are meant to adorn and illustrate it.

But enough of this. Some years since a distinguished French architect visited this country to learn from actual observation the progress its people had made in the Arts, and especially in that in which he took a professional interest. Happily it was before the work upon which we have been commenting was begun in the National Capitol. He was taken, however, to a private house in this city—the owner thereof shall be nameless—where the style since employed at Washington had been prefigured with lavish expenditure. He was called upon to observe and to admire, and to enhance that admiration he was assured, with the not unusual ratiocination which distinguishes our countrymen, that the cost of the interior decoration had been not less than thirty thousand dollars. "Thirty thousand dollars!" exclaimed the Frenchman; "it is much money." He was urged to give an opinion upon the merit of the work. "Ah!" he said, with an expressive shrug, "it is a great deal of money. But if your friend is rich I advise him to think no more of what he has lost, and whitewash his walls!" We are a rich nation, and could follow no better counsel in regard to the national dwelling-place at Washington.

If the mural painting of the Capitol seems to have been done by the acre, there is a like reason for supposing that the painting upon canvas was contracted for by the rod. The country is fortunate that the contracts have not been large ones. These works of art are all in the Rotunda, and consist of portraits of Presidents, and eight large historical paintings, or what are meant to be so. When the Capitol is fitly adorned with works of art, as, in due time, it is to be hoped it will be, some of these pictures will find their proper place, as they are valuable for their historical associations.

When Raphael was invited to Rome by Julius II. he found in the Sistine Chapel some of the works of his predecessors which the Pope desired should be destroyed. Among them the artist recognized those of his old master Perugino, to destroy which, he said, would be a violation of his own conscience, and a wrong done to the History of Art. Some of the pictures in the Rotunda of the Capitol are valuable for a similar reason, as they mark the progress of art in this country. Of the portraits little need be said, as they are neither attractive for their merit as paintings, nor especially valuable as portraits. Of the large historical paintings, those by Colonel Trumbull, like Perugino's in the Vatican, should be religiously preserved, as the earliest specimens of works of this character by an American artist, as well as for the subjects of which they treat. The most valuable and most interesting of these is "The Signing of the Declaration of Independence." Precisely what its merits or its demerits as a painting may be, it is difficult to tell in the position and under the light in which it is now seen. Nor is it a matter of much moment, as its value is quite independent of its character as a mere painting. John Randolph called it "the shin-piece." If shin-piece had not happened to have struck his fancy, he might have called it "head-piece," which would have been quite as significant and much more true. Mr. Randolph's sarcasm was, in fact, a pointless witticism. Its value consists in its being an actual scene, with portraits from life of the men engaged in it, and in the costume of the period; and when compared with historical paintings in Europe of that, or an earlier time, when men wore breeches, the skill of the artist is evident in the management of the point which Mr. Randolph succeeded in making ridiculous. But even were it otherwise, that would hardly detract from its value as a true representation of an event of so much interest and importance in the history of the country, and as a work of reference for future artists.

The other pictures by Trumbull have less value as works of art, but possess something of the same merit as historical works. Others by other and later artists, of which happily there are only four, are purely imaginative compositions, and it is not of much consequence what may become of them, though till something better takes their places they will probably cover the space they now occupy. "De Soto discovering the Mississippi" is striking for its brilliancy of color, but it is a merit which unfortunately does not belong either to the time or to the occasion. The Spanish soldiers, travel-stained, ragged, gaunt, weary, and worn, could have had none of this gala-day splendor when they reached, after their long and toilsome march through the wilderness, the banks of the great river. This fanciful creation of the artist would far better befit the triumphant entry into the streets of Madrid of the conqueror of an El Dorado, bringing in his train captive kings and queens, and slaves bearing precious vessels of gold and silver, and curious stuffs of new texture, and gorgeous dyes, than the end of the pilgrimage of that homesick and wretched band. "The Embarkation of the Pilgrims" is better in conception, and not so false in treatment. It represents the Pilgrims on their departure from Holland, and is unquestionably correct in costume, and veritable in a certain air of sternness and simplicity which belonged to those brave men and women. It is well drawn, and the figures well grouped, but, unless the light of the Rotunda deceives us, the artist has committed the singular error of portraying an event which took place in broad day, and on the deck of a ship, in shadows and colors as dark and gloomy as those pervading a dimly-lighted room. In the two other large paintings, the "Landing of Columbus," and the "Baptism of Pochahontas," there are no redeeming points. We could have forgiven Mr. Randolph any sarcasm with which he might have visited, had he ever seen it, such treatment as has been bestowed in the last of these two pictures, upon the Princess from whom he was proud to claim descent.

SCIENCE, INDUSTRY, AND INVENTION.

BESSEMER'S IRON AND STEEL PROCESS.

The Franklin Institute Journal for March, 1860, contains a paper upon the manufacture of iron and steel by the process of Bessemer, which four years since excited so much interest among scientific metallurgists. This paper was read May 24, 1859, before the Institution of Civil Engineers, and is given without comment, as extracted from The London Artisan of July last, to which it is credited. A process for which so much is claimed in the article, when presented to the American public, might well, in a scientific journal, have been accompanied by some remarks explaining why metallurgists entirely distrust the soundness of the operation for economically producing iron or steel, and this notwithstanding the statement in the paper referred to, that the new process is rapidly extending itself over Europe. It is stated that in Sweden several hundred tuns of excellent steel have been made by it by the firm of Daniel Elfstrand & Co. of Edsken; and other manufactories have been started in their immediate neighborhood. In France, too, the firm of James Jackson & Son, near Bordeaux, are said to have introduced it in their steel works, and were about doing so at the blast furnaces in the Landes. In the south of France also it was to be tried; and in Sardinia and Belgium preparations were making for working the system. Russia had sent to London an engineer and professor of Chemistry to report upon it, and Prof. Müller of Vienna, and M. Dumas of Paris, had visited Sweden to inspect and report on the working of the new process.

The paper describes the method of manufacture and the results obtained in large masses of malleable iron and of steel, both of which may be run out in a liquid state and received into molds of such objects as it is desirable to obtain in these materials. In this way boiler plates have been made of steel and also of malleable iron, the plates being of unusual size and strength. A cannon also of malleable iron had been made by casting, and the process was recommended as of immense importance to the governments of Europe in this application. Had these statements been presented without a particular description of the process and the principles involved, they could not fail to keep alive the excitement which the first announcement of the new operation created. But the article itself contains abundant evidence of the serious difficulties lying in the way of its successful adoption.

The puddling process in the first part of the paper is affirmed to be defective by reason of the surface oxidation of particles of iron throughout the mass, and a coating of particles with silicate of oxide of iron. These imperfections, the author states, are not wholly removed in the process of squeezing and hammering and so far as they remain they injure the quality of the iron, and also of the steel that may afterward be made of this iron. The extraordinary statements follow that the other malleable metals, "as gold, silver, copper, zinc, tin, and lead, owe their valuable exemption from the defects universally found in puddled iron simply to the fact, that they were purified and refined in a fluid state, and while still fluid were formed into ingots, whereby the cohesion of every particle in the mass was insured. If, then, the refining of other malleable metals, while in a fluid state, and their formation into cast ingots rendered all such metals more sound and homogeneous than iron, while it did not lessen their ductility, why should iron forever remain an exception to the general rule?" The idea is a novel one that the unoxidizable metals are free from the defects incident to the most oxidizable metal, simply because they were not exposed to the same oxidizing action in their preparation. From this introduction we should expect to find the new process eminently free from any tendency to oxidize the iron. From the description of it which succeeds, it is worthy of notice that the accounts are all given in the past tense, leaving it to be inferred that nothing was doing at the time the paper was prepared. Cases of failure are admitted, the causes of which are stated not to be those which had been commonly assigned. "Chemical investigation soon pointed out the real source of difficulty," and as well as can be understood from what follows it would appear that this is the impossibility of getting rid of the phosphorus and sulphur present in most pig irons, and which seriously injure the malleable iron and steel prepared from them. Resort was therefore had to the best kinds of Swedish pig iron, which are made from the purest ores, and the capacities of the hematite mines of England are discussed for producing pig iron that could be applicable to the process. When run out from the blast furnaces the plan is to conduct the metal into the converting vessel. That which had been found most suitable somewhat resembled the glass retort used by chemists for distillation. It was mounted on axes, and was lined with "ganister," or road drift, which lasted during the conversion of thirty or forty charges of steel, and was then quickly and cheaply repaired or renewed. The vessel was brought into an inclined position to receive the charge of crude iron, during which time the tuyeres were above the surface of the metal. As soon as the whole charge was run in, the vessel was moved on its axes, so as to bring the tuyeres below the level of the metal, when the process was at once brought into full activity, and twenty small though powerful jets of air sprung upward through the fluid mass; the air, expanding in volume, divided itself into globules or burst violently upward, carrying with it a large quantity of the fluid metal, which again fell back into the boiling mass below.

The oxygen of the air appeared in this process, first, to produce the combustion of the carbon contained in the iron, and at the same time to oxidize the silicon, producing silicic acid, which, uniting with the oxide of iron obtained by the combustion of a small quantity of metallic iron, thus produced a fluid silicate of the oxide of iron, or cinder, which was retained in the vessel, and assisted in purifying the metal. The increase of temperature which the metal underwent, and which seemed so disproportionate to the quantity of carbon and iron consumed, was doubtless owing to the favorable circumstances under which combustion took place. These circumstances appear to be the diffusion of the combustible body throughout the mass, and the absence of any "intercepting material to absorb the heat generated, and to prevent its being taken up by the metal." In ten or twelve minutes the mass was thrown into boiling action, rising far above its natural level, forming a sort of spongy froth, with an intensely vivid combustion going on in every one of its numberless, ever-changing cavities. A meter was employed by which "the amount of decarbonization of the metal was regulated with great accuracy." According to the number of cubic feet of air driven in, "steel of any quality or temper could be obtained with the greatest certainty. As soon as the metal had reached the desired point (as indicated by the dial), the workmen moved the vessel so as to pour out the fluid malleable iron or steel into a founder's ladle, which was attached to the arm of a hydraulic crane."

To every one conversant with the composition and properties of steel, these remarks cannot be regarded otherwise than simply absurd. Cast iron contains from three and a half to five per cent of carbon—steel from one and a half to two per cent. It is one of the most difficult chemical problems to determine what the proportion is in any iron. This statement assumes that the exact quantity is known in the charge, and from this the exact amount of air required to consume it is determined. It then assumes that *all* the oxygen in the air introduced is applied to the combustion of the carbon, making no account of that which combines with portions of the iron—a combination which to some extent the author has already admitted takes place; and also assumes that none of the oxygen escapes uncombined with carbon, which is very likely to occur, or it may combine in the form of carbonic oxide as well as carbonic acid. These uncertainties are fatal to any attempts at exact dosing of the quantity of oxygen to be admitted for the consumption of given portions of carbon (even if these could be given with accuracy), when the effect is to be nicely adjusted to leaving unconsumed in the mass of metal an amount of carbon not varying one-quarter or one-half per cent from the proportion required; for a greater variation than this would render it uncertain, when the founder poured out the metal, whether he had obtained malleable iron or steel.

The oxidation of the iron is passed over as a matter of very little consequence in this process, though made of so much account in the puddling. It is affirmed that the oxide of iron produced is small in quantity, and combines with the silica in the iron, forming a fusible slag, which is separated as the liquid product is drawn off. This assumes a nice adjustment of the amount of oxide of iron just sufficient for the silica that may be present; for if an excess is produced, it is not apparent how this is to be got rid of, nor why it should not prove equally detrimental with that produced in the puddling process. Metallurgists are generally convinced there is a large production of oxide of iron in this operation. The vivid combustion which goes on, exhibiting the peculiar brilliancy of burning iron, is an evidence of it, and so is the intense heat evolved, which is far greater than that which the amount of carbon present can be considered capable of producing. According to the representations of those interested, the combustion of three or four pounds of carbon should not merely keep in fusion, but throw into most violent boiling action, about 100 pounds of metal—an effect which can hardly be regarded within the calorific power of the combustible, however favorable the circumstances under which the combustion takes place. A loss of 12½ per cent of metal in the furnace, increased to 18 per cent in the finishing rolls, is admitted in one of the original papers of Mr. Bessemer, in which he claims that by the puddling process the loss is 28 per cent. Beside the loss by oxidation, whatever this may be, the effect of the intense heat upon the iron is described by others as detrimental to the tenacity of the metal. The paper, however, read before the Institution of Civil Engineers, claims for the product a greater tenacity than that of iron obtained by other methods.

The account given of the durability of the vessels lined with "road drift," in which the operation is conducted, must be received with much incredulity by metallurgists. It is difficult to believe that any vessel subjected to the intense heat of melted iron almost or entirely decarbonized, and boiling with violence, can be made to last through thirty or forty charges, and then be easily repaired or renewed. In the production of cast steel by melting with a carbonaceous flux pieces of malleable iron, a process of manufacture recently established in this country, an account of which we propose to give in a succeeding article, it is the great cost of the crucibles, the best blue or graphite pots, which is a serious obstacle in the success of the operation; and such we should expect would be the case with the vessels employed in the Bessemer process.

The next paper upon this subject will contain a description of a new method of obtaining steel from pig iron, recently invented in this city, which promises to accomplish by a very economical and simple process, purification of the iron from sulphur and phosphorus, as well as the separation of any exact amount of carbon required, without application of excessive heat—not even sufficient to melt the pig iron.

THE SPRING FISHERIES.

Accounts from the Chesapeake Bay represent it as being literally alive with shad and herring. The latter are showing themselves in swarms of unexampled magnitude, even for those celebrated waters. One fishing master is said to have caught 1,800 barrels at a single haul; another 1,000, and many others are catching from 500 to 800 barrels daily. The run of herring is said to be greater than has been known for thirty years, and those engaged in taking them will be likely to make small fortunes.

There are many interesting facts in the history and peculiar habits of the herring. This fish is never known to spawn in the fresh waters of Europe. Until the discovery and settlement of this country, it was an unsolved problem with naturalists of the Old World as to whither they resorted to perform this operation. But it is now known that the vast schools which traverse the ocean, visiting the shores of Europe in their progress, are on their annual journey to the American coast, in the creeks and rivers of which they find their favorite spawning ground. The herring is a fish of passage. It follows one annual route in the sea, shifting its climate with the sun, and it is the same school which is found at one time in Great Britain, and at another in America. There is no visible difference in the fish caught on the English coast and that caught on ours, except that the former are somewhat fatter and rounder than the latter. Their great feeding ground is in the Arctic circle, amid perpetual ice, and from this region they issue annually forth, fat and juicy, to be caught and devoured by the waiting nations on the eastern skirt of the Atlantic. On their long, and doubtless weary journey of many thousand miles before reaching the American coast, they are no doubt deprived of the peculiar food which cooler waters afford them, and hence they reach our coast in worse condition than they are found at the British islands.

The movements of the herring appear to be slow and deliberate, governed by an instinct which enables it to distinguish season, climate, and temperature. In June it is found in the North Sea, and about the Shetland Islands. Here the vast school divides and literally surrounds all England and Ireland, where countless numbers are taken and cured. The appearance of this grand shoal is marked by certain signs, such as the numbers of birds which follow to prey on them, while it even alters the very appearance of the ocean. It is divided into distinct columns of five or six miles in length, by three or four in breadth, which drive the water before them in a perceptible ripple. Sometimes they sink for a few minutes, and then rise again to the surface. In fine weather they reflect a variety of gorgeous colors, like a field of precious gems. At the Shetland Isles one wing takes to the east, and the other to the western shores of Great Britain, where they fill every bay and creek with their prodigious numbers. They then pass through the British Channel, and then measurably disappear. The western column, after offering itself to the great stationary fisheries of the Hebrids, proceeds to the north of Ireland, where it again divides, surrounds the island, rejoicing and feeding the inhabitants, and then disappears in the immensity of the ocean. The numbers taken from these columns while sporting around the British islands, must count up by tons of millions. Five years ago the catch amounted to 900,000 barrels, employing 12,000 boats, manned by 41,000 fishermen and boys, while the total number employed in the fisheries was 94,000.

After leaving these islands, the divided columns again unite in one vast shoal, and taking a southwesterly course, strike the coast of Georgia and Carolina toward the end of January, and coasting thence eastward to New-England, they divide and penetrate the numerous bays and rivers of the coast for the purpose of depositing their spawn. This instinct of migration was given to the herrings that they might deposit it in warm waters, that would mature and vivify it more assuredly than those of the frozen zone. It is not from a deficiency of food that they thus set themselves in motion, for they reach the British islands full of fat, and on their return northward from their spawning ground are universally observed to be lean and miserable. After spawning, the herrings move off to the Arctic seas, leaving the young shoals in the rivers where they were hatched. Here the latter remain during the Summer, but disappear during the Autumn, and rejoin their parents.

The fish was unknown to the ancients, being rarely, if ever, found in the waters of the Mediterranean. Yet, the adventurous Dutch engaged in the fishery as early as 1164, and pushed it to prodigious extent. It is to them the world is indebted for the invention of salted herring. The inventor, Beukelson, died in 1397. It gave an immense impetus to the fishing interest, by enabling distant communities to use fish as food. All Europe was at that time Romanist, and fish became the great article of consumption among millions during Lent. The Dutch, in consequence of this discovery, long maintained the ascendancy in fishing. But since the Reformation, and the general lax observance of Lent in Romish countries, the consumption of herring has so diminished that it is now less, on the Continent, than in the fourteenth century. Charles V. regarded the inventor of salted herrings as a public benefactor. He visited his grave, and ordered a magnificent monument to be erected to his memory. But history has failed to preserve the memory of him who invented the smoked herring.

THE SHAD AND ITS ENEMIES.

The marine fish, which, impelled by a wonderful instinct, approach our coasts at various seasons, seem to be in search of a place of deposit for their eggs, where the young fry may pass their first period of growth in the warm and shallow waters which bathe our shores.

The salmon, the mackerel, and the herring tribe, among these, are the best known because the most useful to man, who takes advantage of this natural instinct to capture them in large numbers at these seasons. Many other fish approach our coasts also for the same purpose, but do not ascend our rivers like the salmon and the shad, which appear to make the most strenuous exertions to reach the actual head of navigation, and in the case of the salmon even go beyond it. The shad, however, passes up our rivers to a higher point than any other species of its tribe, attaining in the Hudson River a distance of one hundred and seventy miles from the ocean It belongs to the division of fish called by naturalists *Clupeidæ*, from the clypei, or scaly shields on the abdomen. To this division belong also the herring, the anchovy, the sardine, the sprat, and the white bait of Europe and the menhaden, the Fall shad, the alewife, the thread herring, and other small species of our coasts. None of the fish of this division have conspicuous teeth, and some have not any at all. Their food consists of the smaller crustaceous or crab-like animals which are found in vast numbers on the surface of the ocean in patches (floating and feeding on still more minute organisms) and perhaps also swallowing the small jelly-fish which live in the same manner. As this kind of food is not found in our rivers or fresh waters in any abundance, it is evident that the fish do not ascend the rivers in search of a more abundant supply of nourishment.

The shad, as most New-Yorkers well know, makes its first appearance at the mouth of the Hudson River in the Spring, varying in date from the 7th to the 27th of March, and reaching Poughkeepsie, some eighty miles from the ocean, about three weeks afterward. It, however, is not caught in any numbers until the third week in April, when it is sometimes so abundant that they have been sold at ten dollars a hundred. In other seasons, from some unknown cause, it is less plenty, and cannot be had at less than twenty-five dollars a hundred in the hight of the season. It continues to be brought to market until July, when the fish become scarce and poor, and are no longer taken by the fishermen. It does not travel in compact schools or swarms, and swims about mid-water between the surface and bottom, and rarely turning aside to avoid any obstacle to its free passage. From this peculiarity in its habits the fishermen are enabled to capture it in large numbers by means of *set* or *gill nets* fastened to poles placed across the stream. These rows of poles are sometimes placed directly across the river channel, and in such numbers between Staten Island and Albany that it seems wonderful how a single fish can escape the insidious snares which beset their upward journey. The evil thus done increases every year, and must, before a very distant period, cause the entire destruction of the fish, for it is supposed, with good reason, that the shad, like the salmon, seeks only to enter the rivers where it has been bred. The capture of a single gravid female must cause the annihilation of at least twenty thousand of the young fry. Allowing that of each fish, from the various enemies which pursue them, only one hundred young are produced, which reach the sea, and that three-quarters of these again are devoured by other fish in the ocean, it will be seen that one fish out of twenty-five must escape the nets, in order to keep up the usual run of shad in each year. The eggs of fish are greedily devoured by a host of different aquatic animals, all seeking eagerly to obtain so delicate an article of food. Other fish, frogs, and salamanders, perhaps tortoises also, and aquatic insects, crayfish, and even water birds, all make sad havoc among the fresh-dropped eggs or the newly hatched fry of the shad, so that it seems even marvelous that a single fish should escape the circle of dangers which encompass it. At sea the full-grown fish are not safe, though here the vast spaces of ocean which are not visited by predaceous fish afford them a comparatively safe asylum. The porpoise, the shark, the tunny, the bonito, and the blue fish or horse-mackerel, perhaps also the striped bass, are busy thinning out the schools of shad and herring, gorging themselves with the oily and soft flesh of these unresisting fish. A single fish, however, taken in the river nets, causes greater diminution among their ranks than all their aquatic enemies taken together, and unless checked by regulations strictly enforced, the hosts of this valuable fish which at one time frequented our rivers, must gradually and surely be diminished to a point at which the numbers taken will no longer afford a profitable return for the capital invested in the appliances for their capture.

The remedy seems to be simple enough, and with the following suggestions for the regulation of the shad fisheries embodied in the shape of a law by the New-Jersey and New-York Legislatures, and strictly enforced by the Supervisors of the river counties, we should again see the shad ascending our river in countless numbers and offered for sale at a price within the reach of all our citizens.

First: A channel-way should be prescribed by such natural landmarks as would easily bound it unassisted by a map, of such width as may be most proper for the various depths of the river in its course from Albany down, and no set or seine nets should be allowed inside of it without incurring a reasonable penalty.

Secondly: No nets should be allowed to be set until the 5th of April.

Thirdly: All nets to be taken up after the 1st of June.

Fourthly: No nets to be used of a smaller mesh than —— inches.

These simple regulations would not be oppressive in their observance, and, with moderate penalties attached to their violation, could be easily enforced. A proper person in each county might be paid by the season to see that they be observed for a year or two. After that time their advantage would be so apparent that the fishermen themselves would enforce them on each other. It might also be worth while to try the effect of artificial propagation in ponds and streams protected from the destroyers of the eggs. Allowing about twenty thousand eggs to a mature fish roe, a few only of these, properly hatched, would nearly repopulate the river. The favorite spawning grounds of the shad should be ascertained, and no nets or disturbance should be suffered to approach them.

To show how easily artificial propagation may be carried on, the following instance will suffice: In April, 1856, millions of the young fry of the white fish (which is of the salmon tribe) were seen around the piers at Sandusky, on Lake Erie, and this unusual appearance was only to be accounted for by the fact that large numbers of these fish had been cleaned on these piers the Autumn previous, and the offal thrown into the lake. The roes and milt had thus been placed in favorable conditions for the production of the young fish. This mode of proceeding might be imitated with the shad roes this very season in the North River.

In a succeeding paper the history of the migrations of the shad as far as known will be given, with some details on others of the herring family. S.

PROTECT THE BIRDS AND FISH.

We thank the Legislature that last adjourned for Chapter 384 of the Laws of the State of New-York—an act entitled "An act for the Preservation of Moose, "Wild Deer, Birds, and Fish." By the 1st section of this law, to kill—nay, to pursue with intent to kill—a fawn, or the fawn's mother or father, or a moose, during the months of January, February, March, April, May, June, and July, or to have in a hunter's possession a green skin of a deer, or a ham of venison or venison steaks, between the 15th day of February and the 31st day of July, is an offense punishable by a fine of $25 for every moose and deer so murdered, and every green skin and venison ham or steak so held in lawless and unsportsmanlike possession.

By the second section of this act, a penalty of $2 is imposed upon the misdemeanor of killing, or having in possession, or exposing to sale, woodcock, between Jan. 1 and July 4; of so abusing partridges, and the expectation of partridges, between Jan. 15 and Sept. 1; the same of quails between Jan. 1 and Oct. 15; and do. of wood, black and teal ducks, between Feb. 1 and Aug. 1. For this section, O Legislature of not good fame, we heartily thank thee!

We thank thee, too, for punishing the crime of killing a prairie fowl in the whole length and breadth of this State, for five years to come, with a fine of $5 for each and every bird so killed—for punishing the sneaking villainy of snaring or trapping quail and grouse, with a fine of $10—for guarding the blue bird, oriole, finch, thrush, lark, sparrow, wren, martin, swallow, robin, bobolink, nightingale, woodpecker, and even the night hawk, against guns, cages and traps with rigid half-dollar penalties—for your merciful extension of $5 penalties over each the smallest speckled trout (brook or river), lake trout, salmon trout and the imperial muscalonge during the months and times in the act aforesaid mentioned—penalties which will blister anglers, fish dealers and fish-eaters.

We thank the Legislature for "squelching" the inhuman and wasteful offense of catching fish in the fresh waters of this State, by hook, by crook, and by net, during the months of December, January, and February—and we feel greateful to that generous spirit of true sportsmanship, which has induced a number of the young gentlemen of this city to organize themselves into a Club to enforce the provisions of this game law within the County of New-York. Will the young idlers or blackguards who own, borrow, or steal firearms, and persecute birds out of season unto death, and the dealers in game out of season, take timely notice that a true sportsman and sharp lawyer, Charles E. Whitehead, the Secretary of the New-York Sportsmen's Club, will have a sharp eye upon the violation of this humane statute, and will make it both unpleasant and unprofitable as far as he can. We solicit from all good citizens aid and encouragement to the New-York Sportsmen's Club, and a special upholding of its Secretary's hands by timely information and sufficient testimony.

RECENT IMPORTANT GIFTS TO YALE COLLEGE.

The building formerly used by the Medical School in New-Haven was bought some time ago of the Medical Department of the College, by Joseph E. Sheffield, esq., and presented again to the institution, for the use of the Scientific Department, including the Schools of Chemistry, Agriculture, and Engineering. Within the past year, the edifice has been remodeled and enlarged by Mr. Sheffield at a great expense, and is now almost ready to be occupied. This gift is the largest single act of munificence by which the college has been favored since its foundation, if we except the Ellsworth legacy, from which nothing has as yet been received. The litigations concerning that estate are in a fair way of compromise between the residuary legatee and the heirs.

In connection with Mr. Sheffield's gift of a building for the Scientific School, an effort is making to raise a fund for carrying on the instruction in that department. Within a few weeks, Oliver F. Winchester, esq., of New-Haven, has made for this purpose the liberal gift of $5,000.

A lot of land, in a retired and elevated position, about a mile north of the College buildings, beyond "Sachem's Wood," has been presented to the College by the heirs of the late James A. Hillhouse, as a site for an Astronomical Observatory.

The College Library has likewise been the recipient of several valuable gifts. Among them may be mentioned three folio volumes, handsomely bound, containing the correspondence between Wm. C. Redfield, esq., the distinguished American meteorologist, and his friend Col. Wm. Reed (afterward Sir Wm. Reed), Governor of Bermuda and Malta, the author of "The Law of Storms," and various important contributions to our knowledge of the atmospheric currents. This correspondence extended through a period of about twenty years, till it was terminated by Mr. Redfield's death. Col. Reed survived him but a few months. The autograph letters of the eminent Englishman and the copies of Mr. Redfield's letters, carefully made from his own letter-book, present a vast amount of scientific information and allusions, which will be highly prized in all time to come, by students in the department to which they were devoted. For this unique and valuable gift the College is indebted to John H. Redfield, esq., of New-York, who has compiled with pious care this memorial of his father.

Richard S. Fellowes, esq., of New-Haven, now traveling in Europe, has sent home to the College a copy of the great illuminated work of Owen Jones, entitled the "Grammar of Ornament." It is a handsome folio, admirably bound, and of great value as illustrating the artistic culture of different ancient and modern nations.

Not long ago, the college came into the possession of a collection of coins, several hundred, which had been the property of Mr. Johns of Canandaigua. These have lately been arranged and classified, and various friends of the college have added to the number. The most important of these gifts, in respect of numbers and value, is that of Mrs. Augustus R. Street, who has presented nearly 500 coins, a large part of them of silver, including many rare and beautiful specimens. This donation comprises both ancient and modern coins, from a great number of different Governments, Asiatic as well as European and American. Mr. Fisk P. Brewer, who is well versed in such studies, has charge of the arrangement and custody of the numismatic collection of the college, which is deposited in the library building. Additional gifts, of a larger or a smaller amount, will be acceptable acquisitions to the cabinet.

These various donations show that Yale College is not without its generous friends, at the present time as in times that are past. Such expressions of good will are gratefully acknowledged, but the chief reward of the donors must be in the consciousness that their liberality is so bestowed that it will always be of service, directly or indirectly, in training large numbers of educated men for stations of public influence and trust.

New-Haven, May 14, 1860. BERKELEY.